Ulsan Landfill Methane Gas Project

Location: Ulsan
Type: Landfill methane gas capture and use
Size: 11,230 tons of methane per year
Funding: Total: US$3,900,000
Public: US$3,500,000
Private: US$400,000
Objective: To reduce the amount of methane gas released to the atmosphere and reduce the need to import and burn natural gas.
Duration: 2000–2002 (construction)
Scale: Urban

Summary

The project captures and reuses methane gas produced from a municipal landfill. The gas is transported to a local industrial site, where it is burned in boilers without being purified. The project saves energy and prevents the exhaust of methane gas into the environment. This international, cooperative effort optimizes public-private, national, and international partnerships and funding to reduce greenhouse gas (GHG) emissions and build Korea's capabilities to install similar projects.

In-Country Principles That Attracted Nondonor Financing

- Capacity building and informed decision making
- Institution building and access to justice and enforcement of laws
- Public participation in, and support of, sustainable development

Capacity-building principles that helped attract private-sector investment included hiring people with appropriate skills, operating utilities under standard commercial practices, creating a management team independent of the government, and providing improved cost-recovery opportunities. Stakeholder partnerships and exchanges, dissemination of best practices, and participation in international forums helped increase awareness and knowledge of commercial business practices.

Important institution-building principles that helped attract private interest included a successful energy restructuring that embodied comprehensive legal and regulatory reforms and a comprehensive energy law that meets global norms.

Also important were increased public knowledge of, and participation in, energy decision making facilitated by professional training; public education, communication, and outreach programs; and a state-of-the-art system for collecting, demonstrating, and exchanging information on outreach strategies, methods, and tools.

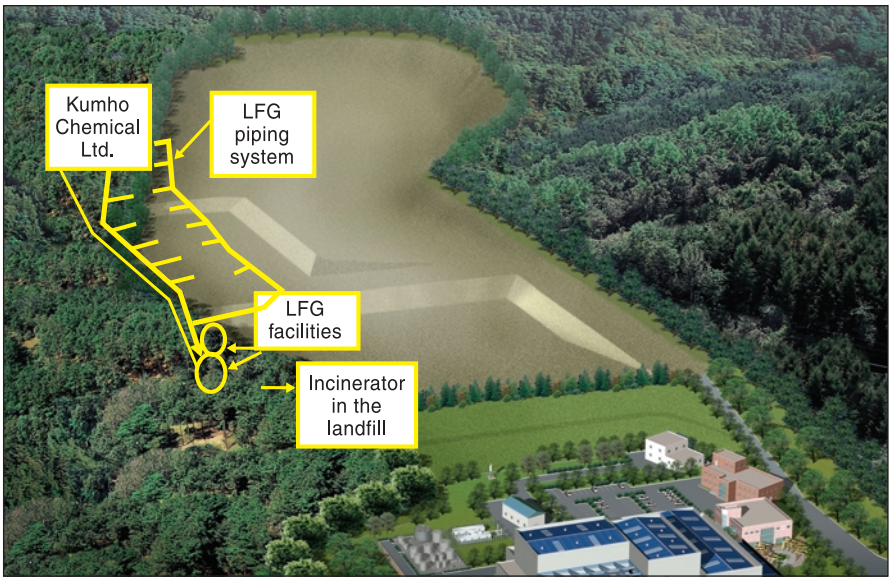
Financing

Total project investment is US$3,900,000. Construction costs of US$3,500,000 were funded through a commercial bank loan to the City of Ulsan using the revolving fund established by the Korean Energy Management Corporation (KEMCO). The Korean government funds and staffs KEMCO to help reduce barriers to energy efficiency. KEMCO funds energy-efficiency projects through a dedicated fund that provides low-interest loans.

Operations and maintenance costs (about US$400,000) are funded by SK Corporation of Korea, a private company, which uses the recovered methane as fuel.

The Project

The Ulsan facility is a lined landfill, which, until recently, flared the methane gases that it generated. The project changes these GHG emissions into useful energy. Methane gas is transported to a nearby industrial site, where it fuels a boiler, thereby reducing methane emissions, decreasing the amount of natural gas that would otherwise be burned, reducing odor from the landfill, and reducing the risk of methane creep and attendant explosions in adjacent properties.



The feasibility study was started in November 2000. The municipality awarded the project in September 2001, and construction started in December 2001. Completion is expected in 2002.

Technical Data

A methane-collection mechanism, transportation pipeline, dewatering device, and connection to the boiler at an adjacent chemical company, which will use the methane as fuel, were installed. An estimated 11,230 tons of methane per year will be collected and used for fuel.

Performance Data

The market value of the methane gas supplied to the boiler over the life of the system is estimated at US$3,400,000. Air quality is expected to improve as a result of reduced carbon dioxide (CO_2) emissions, which are estimated at 84,000 metric tons per year.

Participants and Roles

Ulsan City officials were open to installing a landfill methane project in their city, attended a workshop conducted by the United States Environmental Protection Agency (USEPA's) methane outreach program in Korea, completed the project, and funded the installation. The Republic of Korea's Ministry of Environment implemented standards that changed the way waste is disposed of in landfills, resulting in landfills that have the potential to be developed for methane recovery.

SK Corporation conducted an independent assessment of the site, installed the project, and will use the gas. LFG Consult Aps conducted a feasibility study for SK Corporation to determine the capability of the landfill to generate gas and helped with project design.

The United States-Asia Environmental Partnership (US-AEP) provided initial funding for the US Department of Energy's (USDOE's) National Renewable Energy Laboratory (NREL) and the USEPA to pursue development of a Clean Technology Initiative in Korea.

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